

# Resolving Contradictions of Predictive Validity of University Matriculation Examinations in Nigeria: A Meta - Analysis Approach

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## Abstract

The study examined the various means of solving contradictions of predictive studies of University Matriculation Examination in Nigeria. The study used a sample size of 35 studies on predictive validity of University Matriculation Examination in Nigeria, which was purposively selected to have met the criteria for meta-analysis. Two null hypotheses were generated and tested at 0.05 level of significance. The data collected were tested using t-test statistics and fisher's Z-transformation at 0.05 level of significance. The findings of this study revealed that studies with sample size of 120 and above is significantly different from studies with sample size less than 120. Published journal articles are more significant than their unpublished studies like master's thesis and Ph.D. dissertations. Based on the findings of this study, it was recommended that researchers should not use sample size less than 120, the larger the sample size, the better the result for predictions. It was also recommended that unpublished studies should undergo editorial review to reduce some of the flaws in unpublished studies.

**Keywords:** Effect size, predictive validity, meta-analysis, sample size.

## 1. Introduction

Past research works on predictive analysis studies reviewed showed that there are many research studies on predictive validity of University Matriculation Examination, as there are many studies so also are their variations and conflicting research results. While some studies have shown that academic achievement can be predicted from grades assigned to students in previous works, others have shown there are no relationships at all. These contradictions are clearly revealed in the studies carried out by the following authors; Ogedengbe (2000) mentioned that JAMB results are far from reflecting the true relative abilities of candidates, Ogedengbe further said that candidates admitted into the Nigerian Universities through JAMB, many of whom were credited with high scores such as 260 or 270, or more are being forced to withdraw due to intolerable poor academic performance. Oluwatayo (2003), discovered that UME had low predictive strength on undergraduate performance while in the works of Bamgbose et al (2001), there was a stronger correlation in the performance of students at the 100 level examinations with the SSCE grades than their JAMB scores. He also found out that students who were admitted on merit had a statistically significantly high score.

Ehigie (2001), in his study of validity test of UME as a predictor of performance in university examinations found that there existed a significant positive relationship between students' performance and JAMB UME scores at the faculty of Arts, Sciences of University of Ibadan with a coefficient of 0.41 and 0.32 respectively.

Umo and Uezendu (2010) examined the relationship between UME scores and post UME score at the University of Nsukka 2006/2007. Low correlation was obtained.

Busayo (2010) tried to compare the scores of UME and post UME students of the defunct The University of Education (TUNEDIK) Ikere Ekiti reported that 56.5 % of people who passed UME later failed post UME. Chike, Ifedie and Ifedili (2010), conducted the assessment of UME and post UME at the University of Benin, his major findings showed the supremacy of post UME over UME. On the other handntry, Ajaja(2010), examined the influence of post-UME on the achievement of science education students in Delta state university, his findings showed that no significance difference in the CGPA was found between UME and post-UME scores of the sampled students. There was a decline in the performance of students admitted with post-UME screening.

## What is meta-analysis?

Meta-analysis is bringing together of data from a large collection of past research on a particular topic for the purpose of integrating the findings. In meta-analysis primary research reports constitute the data for statistical integration

Glass (1976) said both the primary studies and their findings are quantified so that the statistical integration can be performed. It is an attempt to correct the weaknesses in individual research by integrating the findings of past research studies

### 1.1 Statement of the Problems

The inconsistencies in the results of past research studies on predictive validity of university matriculation examination called for attention and something urgently needed to be done to resolve the inherent flaws in individual work.

To resolve the flaws, the study will find out the extent to which the effect size and the heterogeneity of the sample sizes used by different researchers had contributed to the variance in the strength of previously reported predictive studies leading to serious inconsistencies in past research works

### 1.2 Research Hypotheses

In line with the issues raised above, the following research hypotheses were generated and tested at 0.05 level of significance

H01: The effect size of studies less than 120 is not significantly affected by sample size

H02: The effect size of published journal articles on predictive validity of UME is not significantly different from unpublished empirical works on predictive validity of UME.

### 1.3 Materials and Methods

The research design was the ex post facto method. The population for this study included all available published articles in local and international journals, unpublished Ph.D and masters' dissertations, conferences and journal papers that focused on predictive validity of UME in Nigeria

The instruments used for the study was a self-made proforma known as coding sheet which was designed to document, the type of publication, type of significance testing, sample size, calculated effect sizes, recorded probability level and sample type.

#### 1.3.1 Results

The results of the study are presented as follows:

H01: The effect size of studies less than 120 is not significantly affected by the sample size.

T-test showing the effect of sample size of the selected studies on the effect size.

Variable	N	Xr	S.Dr	d.f	t-cal	t-table
Sample size<120	8	0.404	0.342	33	3.221	1.960
Sample size>120	27	0.0364	0.297			

P<0.05

From the table above, the effect size of sample with 120 and above is significantly different from the effect size of sample size of 120 and above at 0.05 level of significance.

Tc= 3.221 while t-table =1.960, the null hypothesis is rejected, the implication of this is that when sample size of any dissertation is less than 120, the result of the study tends to be non-significant.

H02: the effect size of published journal articles on predictive validity of UME is not significantly different from unpublished empirical works on predictive validity of UME.

Table showing the effect sizes of published and unpublished articles.

Variables	N	X of N	R	Zr	Xc	Xt
Published articles	16	302.3	0.409	0.436	5.372	3.85
Unpublished articles	19	1011.3	0.268	0.277		

P<0.05

From the table, the calculated  $X^2 = 5.372$  is greater than the critical value of 3.84. Therefore the null hypothesis is rejected. The effect size of published journal articles on predictive validity of UME is significantly different from unpublished articles. Although there were fewer published journal articles than unpublished, yet there was a sizeable decline in magnitude of correlation co-efficient 'r'

### 1.4 Discussions

From Table1; the result of the hypothesis showed that the effect size of selected studies with sample size less than one hundred and twenty (<120) and sample size greater than one hundred and twenty (>120) is significantly different from each other at 0.05 level of significance. The implication of this is that when sample size of any thesis or dissertation is less than 120; it would affect the result of the study negatively. The larger the sample size the better the effect size which is the result.

This study agrees with Aderinwale (1985) who uses 40 sample size and got an effect size of 0.042, a non - significant result. Onwu (1985) uses 30 sample size and a non - significant result of 0.09.

This study further revealed that the published journal article is more significant than the unpublished journal works like, master's dissertation and Ph.D thesis. This study was in agreement with the work of white(1979) who collected correlation coefficients from published and unpublished literature, he produced evidence of a selective publication effect in his meta-analysis of the relations between social economic status and

achievement are weaker in dissertations than in journals. The significance in published articles may be due to its scrutiny of the articles at every stage before its final acceptance for publication.

### 1.5 Recommendations

Based on the above discussion, the following recommendations were made:

- Unpublished studies like masters dissertation and Ph.D thesis should not use a sample size less than 120
- Researchers should put more effort into the quality of unpublished studies
- Researchers should have a bench mark for sample size that is probably higher than one hundred and twenty.

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